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the opposite side, because the depression is so slight that the curvature of the moon's surface covers the opposite wall." Or again "A dessert dish five inches in diameter (without the border) and less than a quarter of an inch in depth has twice as deep a cavity, proportionally, as the deepest of these depressions."

M. Fauth considers in detail the various theories that have been advanced to account for the origin of these peculiar features of the lunar surface and rejects them all as unsatisfactory. Yet it can not be said that he has disproved the volcanic theory, although he has certainly pointed out many difficulties in the generally accepted idea of that theory. But the theory that he advances in its place, that the moon's surface is covered by a deep layer of ice, will not be accepted without convincing proof.

The book is well printed and illustrated and is well worth reading by those who take an interest in the moon.

C. L. P.

In Starland with a Three-inch Telescope. By WILLIAM TYLER OLCOTT. Pp. 146 with many diagrams. New York, G. P. Putnam's Sons. 1909.

This is a convenient hand-book or guide for the amateur astronomer. A three-inch telescope is too small to show any planetary detail and the owner of such an instrument is practically limited to the study of the moon and of a small number of the brighter double stars. To a description of these objects, therefore, the book is confined.

Only the constellations visible in the latitude of the New England and Middle States are included and these constellations are divided into four groups, corresponding to the seasons of the year in which they are visible. For each constellation a clear and simple page map is given and on this map are marked the positions of the interesting double stars. Facing each map is a printed page, which gives the necessary details for finding and observing these objects.

The moon is treated in a similar manner, eight diagrams of different phases being given.

These show the principal features only and should be of great assistance to the student of lunar detail.

The book is well printed, the maps and diagrams well designed and executed, and the little volume is admirably adapted to encourage the study of the heavens.

C. L. P.

SCIENTIFIC JOURNALS AND ARTICLES

The Journal of Experimental Zoology, Vol. VII., No. 2, contains the following papers: "Wound Reparation and Polarity in Tentacles of Actinians," by Herbert W. Rand. A distal cut end of a tentacle of the large actinian, *Condylactis*, is immediately closed by muscular contraction and remains so during a slow process of structural repair which eventually replaces the muscular contraction. The distal cut end of an excised fragment of tentacle behaves similarly, but a proximal cut end does not close. In the conspicuously different behaviors of proximal and distal cut ends, and in responses to tactile stimulation, the tentacle shows a marked polarity which can not be accounted for upon the basis of its known structure. "A Biological and Cytological Study of Sex Determination in Phylloxerans and Aphids," by T. H. Morgan. An analysis of the behavior of the sex chromosomes in phylloxerans in connection with the behavior of the sex chromosomes in other hemiptera leads to the conclusion that these chromosomes can not be male and female determining as such, but that they are identical in all respects. Two alternative views offer themselves if this analysis is correct. Either sex is determined quantitatively by the amount of elimination contained in the fertilized egg—a view advanced by the author in 1907 and since adopted by Wilson and by Castle in a modified form—or else the presence or absence of the sex chromosomes are associated with other profound, invisible differences in the two classes of spermatozoa. It is difficult to decide at present between these alternatives, but the facts here recorded for the phylloxerans favor the interpretation that the visible chromosomal differences in the two

classes of spermatozoa are associated with more profound differences in the sperm and that it is these differences rather than the difference in quantity alone that have a determinative influence in sex determination. An examination of almost 10,000 male and female eggs of *P. caryæcaulis* shows that the male eggs occur about five times as often as the female eggs. A study of the output of each stem-mother shows that in some cases all of her progeny are males, in other cases all females, and in most cases both males and females with a preponderance of males. The results are obviously not connected with chance combinations of chromosomes, but definite "tendencies" exist in certain individuals that follow one or the other alternative. These tendencies might seem to be the result of external factors, but nothing was discovered in the history of the individuals that favors such an interpretation; although the possibility of such an effect must be granted. The author's general conclusion is summed up in the statement that the quantitative interpretation of sex-determination is only the first rude approximation to a solution. The facts suggest that the visible quantitative differences are associated with more profound changes and the facts described for the phylloxeran egg give some indication of the nature of those changes; for, the sex chromosomes seem rather to follow sex than to be its sole cause. "Factors of Form Regulation in *Harenactis attenuata*, III., Regulation in Rings," by C. M. Child. Under certain conditions short cylindrical pieces from the body of the actinian, *Harenactis attenuata* form "rings" by the union of oral and aboral ends. Such rings may give rise to one or several more or less radially symmetrical groups of tentacles in the region of union.

THE FIRST CRUISE OF THE "CARNEGIE"
AND HER EQUIPMENT¹

THE *Carnegie*, engaged in a magnetic survey of the oceans under the direction of the

¹ Abstract of paper presented before the Philosophical Society of Washington, November 20, 1909, by Dr. L. A. Bauer, of the Carnegie Institution of Washington.

department of terrestrial magnetism of the Carnegie Institution of Washington, entered on her first cruise August 21 last. As may be recalled, this is the first vessel in which the attempt has been made to exclude practically all materials affecting the compass needle. Hence the magnetic data secured on her can be made immediately available, it being now unnecessary to await the determination of troublesome and more or less uncertain deviation corrections.

The tests made at Gardiner's Bay, Long Island, August 21 to September 2, and at Falmouth, England, have demonstrated conclusively that no correction of whatever kind need be applied to the *Carnegie* results. The following table will show the close agreement in the values of the three magnetic elements obtained on the various headings during the swings at Gardiner's Bay:

Ship's Head	Magnetic Declination (Variation of the Compass)	Magnetic Dip.	Horizontal Magnetic Intensity (C.G.S. Units)
N.	11°25' W.	72°01'	.1825
NE.	26	07	23
E.	28	07	25
SE.	22	07	25
S.	22	05	27
SW.	19	02	25
W.	21	05	22
NW.	27	11	23
Mean	11 24	72 06	.1825

Nothing could be more satisfactory than this exhibit of the fulfillment of the requirements as to non-magnetic conditions at the places where the instruments are mounted.

The observations made on the trip from New London, Conn., to St. Johns, Newfoundland, and from there to Falmouth, England, during the severe October gales afforded ample opportunity for trying out the observational appliances, and these stood the tests put upon them, during the exceptionally adverse conditions, even beyond expectations. A large part of the instrumental equipment was especially designed and constructed in the workshop of the Department of Terrestrial Magnetism.

In brief, it may be confidently asserted that